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811

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,049	06/15/2005	Ulf Samuelsson	P/1228-200	2220
2352 7590 05/16/2007 OSTROLENK FABER GERB & SOFFEN 1180 AVENUE OF THE AMERICAS NEW YORK, NY 100368403			EXAMINER NGUYEN, XUAN LAN T	
			ART UNIT 3683	PAPER NUMBER
			MAIL DATE 05/16/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/535,049

Applicant(s)

SAMUELSSON, ULF

Examiner

Lan Nguyen

Art Unit

3683

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-15 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☒ Other: Translation

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1, 3, 4 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borlinghaus et al. (EP 1191245 A2).

Re: claim 1, Borlinghaus shows a disc brake, as in the present invention, comprising: a wheelshaft 6, a brake disc 2, brake yoke 3 with a first and a second support 4 having fastening elements corresponding to holes 12 of the fastening brackets 14, protective plate 11, 15, a fastening bracket 14 to be fastened to the brake supports at 12. Borlinghaus shows the fastening brackets and the protective plate to be of one-piece construction while the claim requires the protective plate and the fastening brackets to be separate elements, which are united with each other. It is well settled that making separable into individual pieces of a one piece construction in a prior art only required routine skill in the art since the fastening brackets and protective plate, as multiple pieces or as one one-piece, still perform the same task and achieve the same purpose. In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961). Hence, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to have modified Borlinghaus' brackets and plate into multiple pieces so that they would be easy to be manufactured and to be installed on a brake system.

Re: claim 3, as modified, Borlinghaus' element 8 would comprise two brackets 14, one on the left and one on the right.

Re: claim 4, Borlinghaus shows the protective plate to be a pressed sheetmetal part.

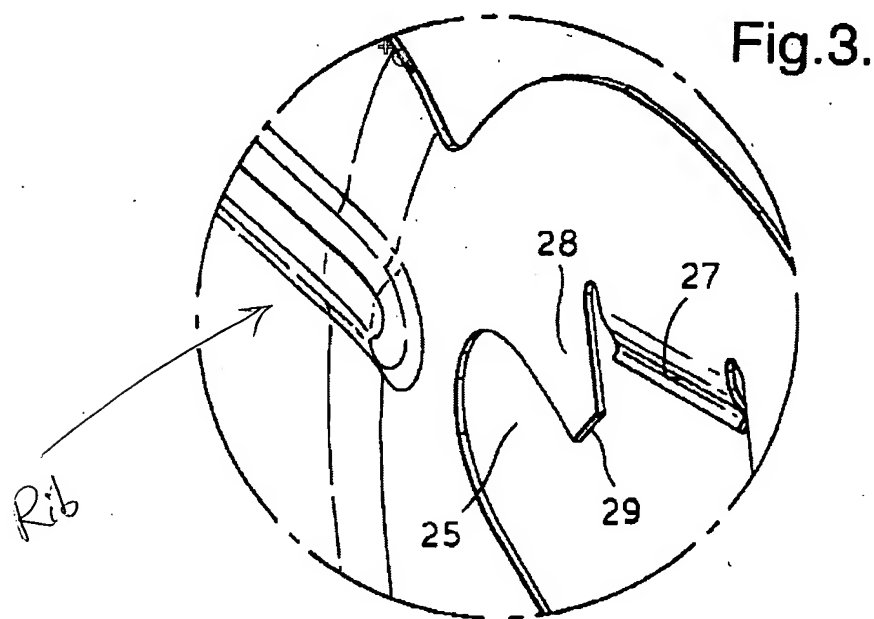
Re: claims 9, 10 and 12-15, Borlinghaus shows the fastening brackets and protective plate as claimed: the brackets 14 extend along the outer periphery of the protective plate 11, 15 wherein the protective plate is larger than the brackets; together, they form a C-shape and are fastened to the brake supports at holes 12. The Examiner takes an Official Notice that rivets, bolts, etc. are well known forms of fastening metal parts together and would have been obvious for one of ordinary skill in the art to employ any of these methods.

Re: claim 11, claim 11 broadly claims a lining holder and a main cover for the brake yoke. Since there are no details have been provided for these claimed elements, they are being treated broadly in that it is inherent in a brake system to comprise linings and lining holder such as back plates, and a main cover such as a bridge part of the caliper in a disk brake system.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Borlinghaus et al. (EP 1191245 A2) in view of Frouin (USP 6,626,272).

Borlinghaus' brake as rejected, in claim 1, lacks the reinforcing ribs. Frouin teaches a brake device with a protective shield wherein the shield is made of sheet

metal, col. 3, lines 21-24 and the ribs as marked below. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Borlinghaus' protective shield to be made of sheet metal and reinforcing ribs such as taught by Frouin in order to provide a strong yet light weight material for the shield to protect the brake disc from the elements.



4. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borlinghaus et al. (EP 1191245 A2) in view of Ishikawa et al. (USP 4,207,971).

Borlinghaus's brake, as rejected in claim 1, lacks a protective housing as claimed. Ishikawa teaches a protective housing 16 which is made of pressed sheet metal, column 2, line 65 to column 3, line 3 cooperatively attached to dust cover 14 to protect the disc 6; wherein the protective housing comprises apertures 19 to further

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protecting the disc 6 from rusting. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Borlinghaus' brake to comprise a protective housing made of sheet metal having apertures such as taught by Ishikawa in order to protect the brake disc from water and rust.

### ***Allowable Subject Matter***

5. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Response to Arguments***

6. Applicant's arguments filed 3/28/07 have been fully considered.
- Applicant's arguments and amendments have overcome the drawing objection and the 112, 2<sup>nd</sup> paragraph rejection.
  - Applicant's amendments have overcome the rejection based on Kawaguchi.
  - Applicant's amendments have necessitated the new ground of rejection based on Borlinghaus as presented above.

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Nguyen whose telephone number is (571) 272-7121. The examiner can normally be reached on Monday through Friday, 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on (571) 272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Xuan Lan Nguyen/ 5-04-07  
Primary Examiner  
Art Unit 3683

PTO 07-1520

European Patent Application  
No. 1 191 245 A2

TRANSLATION

10/535,049

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COVER PLATE FOR DISK BRAKES

Dr. Jörg Ebert and Thomas Borlinghaus

UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, D.C. JANUARY 2007  
TRANSLATED BY THE MCELROY TRANSLATION COMPANY

EUROPEAN PATENT OFFICE  
PATENT APPLICATION NO. 1 191 245 A2

Int. Cl. <sup>7</sup> :	F 16 D 55/00
Filing No.:	01122493.8
Filing Date:	September 20, 2001
Publication Date:	March 27, 2002 Patent Journal 2002/13
Priority:	
Date:	September 21, 2000
Country:	DE
No.:	10047468
Designated Contracting States:	AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE, TR
Designated Extension States:	AL, LT, LV, MK, RO, SI

COVER PLATE FOR DISK BRAKES

[Abdeckblech für Scheibenbremsen]

Inventors:	Dr. Jörg Ebert and Thomas Borlinghaus
Applicant:	BPW Bergische Achsen Kommanditgesellschaft

[0001]

The invention relates to a cover plate for lateral covering of the area of a disk brake not covered by a caliper and/or caliper carrier, especially for commercial vehicles, with the cover plate having an inner edge that is adapted to the caliper and/or to the caliper carrier, and an outer edge that has an essentially circular sector-shaped profile. The invention further relates to a disk brake.

[0002]

For braking moving vehicles, in the state of the art, wheels mounted on an axle or arranged in single-wheel suspensions are equipped with brakes, which can be activated by the driver of the vehicle. The activation is typically performed through pressure, for example, through hydraulic or pneumatic pressure. Here, two fundamentally different types of brakes are distinguished, namely drum brakes, in which stationary drum shoes are pressed from the inside against the walls of a drum rotating with the wheel to slow down the wheel, as well as disk brakes, in which a brake disk (rotor) rotating with the wheel is jammed between brake shoes arranged on both sides of the disk on a caliper (stator) and is thus slowed by friction. Disk brakes can realize a significantly better braking effect than drum brakes, and for this reason are preferred, in order to generate high deceleration forces.

[0003]

To generate an optimum braking effect for a disk brake, the caliper, which carries the brake lining attached on both sides of the brake disk, must guide the brake lining on both sides of the brake disk with uniform pressure onto the brake disk, in order to prevent one-sided wear of the brake lining and thus degradation of the braking effect. Increased wear occurs if sand particles penetrate into the brake system. This is the case, in particular, when the vehicle travels on unpaved roads, for example, sandy paths, or when commercial vehicles travel in areas away from streets, for example, gravel pits, construction sites, or agricultural areas.

[0004]

Here, the disk brake is relatively well covered on the side facing the wheel by the rim of the wheel, the wheel itself, and also an optional additional flange for mounting the rim, but it is open on the side facing the axle and susceptible to the intrusion of dirt or particles containing sand. This leads to the result that the brake disk or brake lining is exposed on this side to a stronger, non-uniform wear than on the side facing the wheel. This problem is even reinforced for commercial vehicles with multiple close-lying axles, because here, dirt taken up by the tires of one axle is thrown in the direction of the adjacent axle and thus also in the direction of the open side of the disk brake.

[0005]

To prevent wear due to such contaminants, typically covers are provided, which cover the disk brakes on the side facing away from the wheel. Such covers are known, for example, from US Patent Nos. 4,155,601 and also 4,317,508. The covers shown here involve covers for disk brakes in the passenger car sector, in which the use of relatively small calipers is typical. For this

reason, the covers can enclose nearly a three-quarter circle in their circular sector-shaped area, which leads to a relatively high stability of the cover plate. In addition, the relatively low temperatures occurring in passenger car brakes place only small requirements on the construction of the cover plate.

[0006]

In the sector of commercial vehicles, however, which feature fifteen to twenty times the permissible total weight compared with passenger cars, for achieving an adequate braking effect, on the one hand, a significantly larger caliper and thus a significantly larger caliper carrier is required and significantly higher temperatures are generated during the braking process. This places different specific requirements on a cover plate for preventing the penetration of dirt into the area of the disk brake. Thus, the cover plate cannot enclose a circular sector of a ca. three-quarter circle, that is  $270^\circ$ , with a pot shape like the known passenger car applications, but instead is limited to significantly smaller fractions of a circular extent. Here, associated with the size of the caliper, a sickle-like shape is produced for the cover plate, which is similar to a linear element in terms of its mechanical load capacity. In addition, the areas of the wheels and the connected brakes are exposed to hard conditions in commercial vehicles because these often travel in areas away from paved streets. These conditions frequently produce shocks, which trigger twisting and bending vibrations in the cover plate and which finally can lead to fractures in such plates. If such fractures are not noticed, dirt can nevertheless penetrate into the disk brake with the negative consequences mentioned above with reference to wear. In addition, the fractured plates must be replaced.

[0007]

Starting with this state of the art, the invention is based on the problem of improving a cover plate of the type named above to the extent that it can also be used for disk brakes with wide calipers and/or caliper carriers and is insensitive to resulting vibrations.

[0008]

To solve this problem, a proposal for a cover plate of the type named above includes a step, which is formed in the area of the outer edge of the cover plate and which runs in the peripheral direction and at which the cover plate transitions over an axial distance from a first cover plane into a second plane lying closer to the brake disk in the assembled state, with the cover plate extending radially outwards into the second plane so far that it ends outside of the radius of the brake disk in the assembled state.

[0009]

The step according to the invention leads to the same reinforcement against bending loads as against twisting loads, so that, overall, the cover plate is less susceptible to vibrations and can withstand the particularly strong loads produced in commercial vehicles. Here, the step can extend continuously in the peripheral direction in the area of the outer edge, but it can also have one or more breaks in the peripheral direction. In addition to reinforcement, the step increases the axial distance between the cover plate in the first cover plane and the brake surface of the brake disk facing the cover plate, which offers an advantage in terms of the friction heat generated during braking. This heat is distributed over a relatively large volume and dissipated via air circulation. The cover plate itself remains at temperatures that do not have a damaging effect on the cover plate. The fact that the cover plate is continued in its outer area of the circular sector-shaped outer edge so far that it ends outside of the radius of the brake disk in the assembled state is dependent on the best possible protection of the disk brake from penetrating particles, so that resulting wear can be reliably prevented.

[0010]

Preferably, the step is formed on the cover plate radially, so that relative to the axle it lies in the area of the periphery of the brake disk for an assembled cover plate. Through a narrow section realized in this way, penetration of dirt into the disk-brake arrangement can be prevented even more effectively.

[0011]

According to one advantageous refinement of the invention, the step extends continuously along and parallel to the circular sector-shaped outer edge of the cover plate. So that the step is realized without breaks, even better reinforcement is achieved.

[0012]

An even more improved reinforcement and especially an improved resistance of the cover plate to twisting vibrations is realized when, as proposed according to one improvement of the invention, the step extends in the edge regions of the (circular sector-shaped) outer edge through continuous transition of the inner step radius to the radius of the outer plate edge. Thus, edge regions of the step, in which the step does not run parallel to the circular sector-shaped periphery, but instead at an angle in the direction of the outer periphery of the plate, are realized in order to extend into this periphery. Such a construction reinforces even more, in particular, the resistance to twisting of the cover plate according to the invention.

[0013]

Even better reinforcement is produced if the cover plate extends along its circular sector-shaped outer edge out of the second plane formed by means of the step angled away from the first plane. Here it is provided that the angle in the assembled state of the cover plate extends past the edge of the brake disk, but ends before the ventilation channels of the brake disk. In this way, in addition to additional reinforcement, a lateral covering of the disk brake is achieved, so that no dirt can penetrate from there into the area of the disk brake. Because the plate ends before the ventilation channels of the brake disk, however, optimum ventilation of the brake disk for dissipating the friction heat generated during braking is guaranteed.

[0014]

For constructing an intermediate space suitable for dissipating the friction heat generated during braking between the cover plate and the brake disk, it is proposed that the axial extent of the cover plate  $\geq 50$  mm. Here, the axial extent is meant to be the distance at which the cover plate ends measured from the first plane.

[0015]

The features according to the invention are used preferably in connection with cover plates, which enclose a circular sector with an internal angle of  $< 225^\circ$  with their circular sector-shaped outer edge. Such cover plates are similarly susceptible, in particular, to twisting vibrations, like linear elements in terms of their response to vibration due to the fact that they enclose only a small circular sector-shaped extent. Thus, they require increased reinforcement.

[0016]

Finally, the cover plate according to the invention preferably provides at least three support and attachment points, by means of which it can be attached to a caliper and/or to a caliper carrier.

[0017]

By using the cover plate according to the invention, a disk brake is produced, which is protected from the penetration of dirt on the inside of the disk brake opposite the wheel, with the cover plate according to the invention having high stability due to good stiffness relative to twisting and bending vibrations. Nevertheless, to be able to replace the cover plate easily and quickly when damage occurs, nevertheless, it is advantageous if this is fixed detachably by means of screw bolts on the caliper and/or the caliper carrier.

[0018]

Additional advantages and features of the invention emerge from the following description of an embodiment with reference to the figures. Shown are:

Figure 1, a partially sectioned side view of a disk-brake arrangement with a cover plate according to the invention for vehicles,

Figure 2, a sectioned side view of the disk-brake arrangement from Figure 1, as well as a wheel hub mounted on the axle journal and flanged on the brake disk, and

Figure 3, a perspective view of a cover plate according to the invention in a construction for non-articulated axles.

[0019]

In Figures 1 and 2, a disk-brake arrangement 1 can be seen, which has a brake disk 2, a caliper 3, and a caliper carrier 4. The caliper carrier 4 is connected rigidly to an axle body 5, which in this case is constructed as a square-tube axle. The axle 5 tapers at its end to an axle journal 6, on which a hub 7 is mounted and which is connected to the brake disk 2 via a flange connection. To be seen is further a cover plate 8 according to the invention, which covers the area of the brake disk 2 not covered by the caliper 3 or the caliper carrier 4. A perspective view of this cover plate is given in Figure 3.

[0020]

Here, in a first edge section, the cover plate 8 has an inner edge 17 formed complementary to a contact edge on the caliper carrier 4. In another outer section, the edge of the cover plate 8 has a circular sector-shaped construction. A step 9 is to be seen in the area of this circular sector-shaped outer edge 18. As can be seen best in Figure 2, the step 9 is located close to, but at a distance from, the periphery of the brake disk 2 in the assembled state of the cover plate 8. Via the edge 9, the cover plate changes from a first plane 14 at a distance from brake disk 2 and running approximately parallel to this disk into a second plane 15 lying closer to the brake disk 2 and also running parallel to this disk. In addition, it is to be seen that the cover plate 8 is axially guided in another bevel 11 in the direction towards the brake disk 2, with the edge 11 of the cover plate 8 extending past the outer edge 13 of the brake disk 2 and up to the height of the ventilation channels 16 formed in the brake disk 2. The steps 9 are used in connection with the outer bevel 11 on one side of a brace of the cover plate 8 and on the other side of a peripheral edge of the area of the disk-brake arrangement 1 in the direction up to the surrounding rim or the wheel, in order to prevent penetration of particles into the area of the disk-brake arrangement 1.

[0021]

Additional reinforcement relative to twisting loads on the cover plate 8 is produced by the fact that the steps 9 each run close to the ends of the circular sector-shaped section of the cover plate 8 through continuous transition of the inner walls 19 of the steps 9 to the radius of the bevel 11. In these areas, the otherwise concentric guidance of the outer edge 18 or the bevel 11 and the steps 9 is produced and the line of the steps 9 transitions smoothly to the radius of the circular sector-shaped periphery of the bevel 11.

[0022]

Through the square step 9, the cover plate transitions from the first plane 14 into the second plane 15, where the bevel 11 starts. Here, the cover plate 8 has an axial extent of ca. 90 mm. The cover plate 8 encloses an angle  $\alpha$  of  $210^\circ$ , seen in Figure 1 in the area of its circular sector-shaped periphery. Through this fact and due to the fact that the edge guided in the section 17 is guided very far in the direction of the circular sector-shaped edge of the plate in the section 18, the cover plate 8 has an approximately sickle-shaped construction and is therefore, in principle, susceptible both to twisting and to bending vibrations. This susceptibility is counteracted by the construction of the shown step 9 and also the rounded transition of the step 9 in the area 10 from an inner diameter to an outer diameter.

[0023]

The fact that the cover plate 8 according to the invention does not project past the ventilation openings 16 of the brake disk 2 in the installed state at the edge 13 of the brake disk 2 has the effect that the air heated by the friction heat generated during braking can be discharged from the brake disk 2. Thus, during braking, the necessary cooling of the brake disk is guaranteed. In addition, the large axial distance between the plane 14 of the cover plate 8 and the brake surface 20 of the brake disk 2 facing the cover plate 8 requires a sufficiently large air space, which can collect heat radiation from the brake disk 2 and can discharge it by means of ventilation. In this way, it is guaranteed that the cover plate 8 according to the invention does not overheat. The distance between the edge 13 of the brake disk 2 and the outer edge 18 of the bevel 11 of the cover plate 8 is dimensioned so that the air space formed between the cover plate 8 and the brake disk 2 is connected to the surrounding air and heated air can be discharged via this path.

[0024]

The cover plate according to the invention has a plurality of attachment openings 12, through which screw bolts can be guided for attaching the cover plate 8 to the caliper carrier 4 or also directly to the caliper 3.

[0025]

The shown cover plate 8 is provided preferably for use with a non-driving, non-steering axle of a commercial vehicle, but it can be modified without additional measures to the extent that it can be used, for example, for a non-driving, steering axle or else also for driving axles of a steering or non-steering nature. Here, the shown cover plate is limited neither to the use with a floating-caliper brake nor to the use with a disk brake with floating disks, but instead can be used for all types of disk brakes.

[0026]

With the cover plate according to the invention, it is possible to cover the remaining areas of the brake disk also for disk-brake arrangements in which wide areas of the brake disk are already covered by the caliper or the caliper carrier, so that resulting vibrations can be reliably absorbed by the reinforcements attached to the cover plate 8, and so that the cover plate 8 does not become damaged due to vibrations. Thus, with the aid of the cover plate according to the invention, the penetration of particles, especially sand-containing particles, into the area of the disk-brake arrangement can be reliably prevented, so that wear, especially of the brake linings on the caliper, can be prevented.

#### List of reference symbols

[0027]

- |    |                        |
|----|------------------------|
| 1  | Disk-brake arrangement |
| 2  | Brake disk             |
| 3  | Caliper                |
| 4  | Caliper carrier        |
| 5  | Axle                   |
| 6  | Axle journal           |
| 7  | Hub                    |
| 8  | Cover plate            |
| 9  | Step                   |
| 10 | Area                   |
| 11 | Bevel                  |

12	Attachment openings
13	Outer edge
14	Plane
15	Plane
16	Ventilation channel
17	Inner edge
18	Outer edge
19	Inner wall
20	Brake surface
a	Axial extent
$\alpha$	Angle

### Claims

1. Cover plate for lateral covering of the area of a disk brake (1) not covered by a caliper (3) and/or caliper carrier (4), especially for commercial vehicles, wherein the cover plate (8) has an inner edge (17), which is adapted to the caliper (3) and/or to the caliper carrier (4), and an outer edge, which has an essentially circular sector-shaped profile,

characterized by

a step (9), which is formed in the area of the outer edge (18) of the cover plate (8), which extends in the peripheral direction, and to which the cover plate (8) transitions over an axial distance from a first cover plane (14) into a second plane (15) lying closer to the brake disk (2) in the assembled state, wherein the cover plate (8) extends into the second plane (15) radially outwards so far that it ends outside of the radius of the brake disk (2) in the assembled state.

2. Cover plate according to Claim 1, characterized in that the step (9) is arranged on the cover plate (8) radially so that it lies in the area of the periphery of the brake disk (2) relative to the axle (5) when the cover plate (8) is mounted.

3. Cover plate according to one of Claims 1 or 2, characterized in that the step (9) extends continuously along and parallel to the circular sector-shaped outer edge (18) of the cover plate (8).

4. Cover plate according to one of Claims 1-3, characterized in that the step (9) runs into the edge areas (10) of the circular sector-shaped outer edge (18) through continuous transition of the inner step radius to the radius of the outer plate edge.

5. Cover plate according to one of Claims 1-4, characterized by a bevel (11), which is constructed in the area of the circular sector-shaped outer edge (18) and in which the cover plate (8) extends out of the second plane (15) away from the first plane (14), wherein the cover plate

(8) is guided up to the edge (13) of the brake disk (2) in the assembled state and ends before the ventilation channels (16) of the brake disk (2).

6. Cover plate according to one of Claims 1-5, characterized in that it has an axial extent of >50 mm between the first plane (14) and an outermost cover plane.

7. Cover plate according to one of Claims 1-6, characterized in that the circular sector-shaped outer edge (18) defines a circular sector with an inner angle of <225°.

8. Cover plate according to one of Claims 1-7, characterized by at least three support and attachment points for fixing to a caliper (3) and/or to a caliper carrier (4).

9. Disk brake, especially for commercial vehicles, with a brake disk (2), a caliper (3) provided with brake linings, and also a caliper carrier (4), characterized in that the area not covered by the caliper (3) and/or the caliper carrier (4) is covered by a cover plate (8) according to one of Claims 1-7.

10. Disk brake according to Claim 9, characterized in that the cover plate (8) is fixed detachably by means of screw bolts to the caliper (3) and/or the caliper carrier (4).

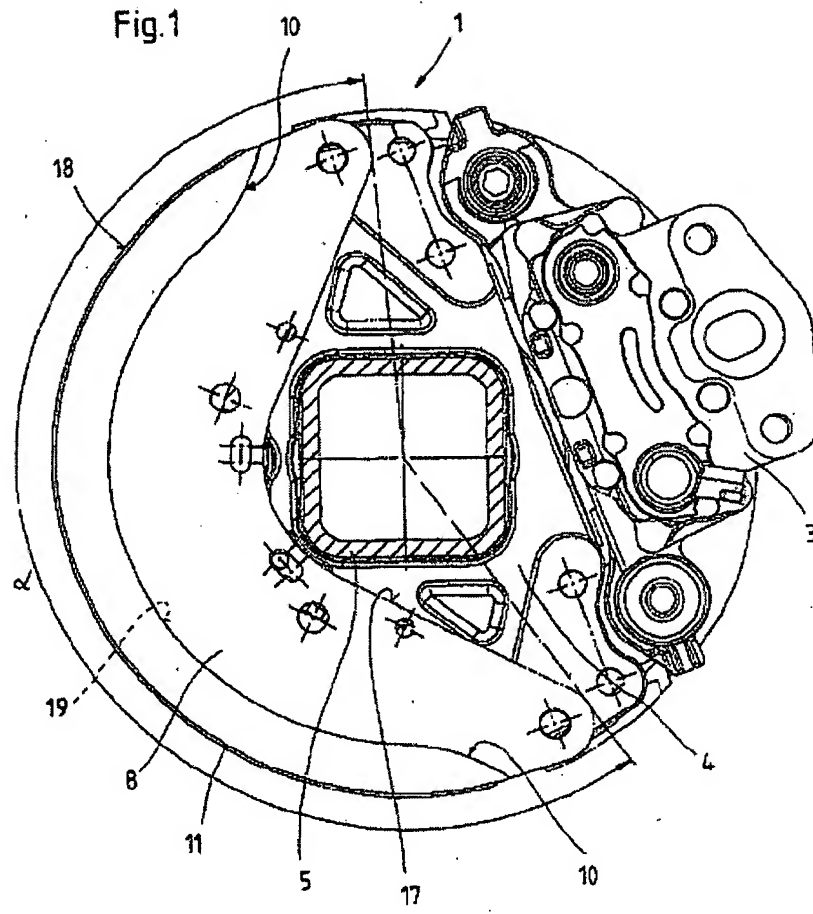


Fig.2

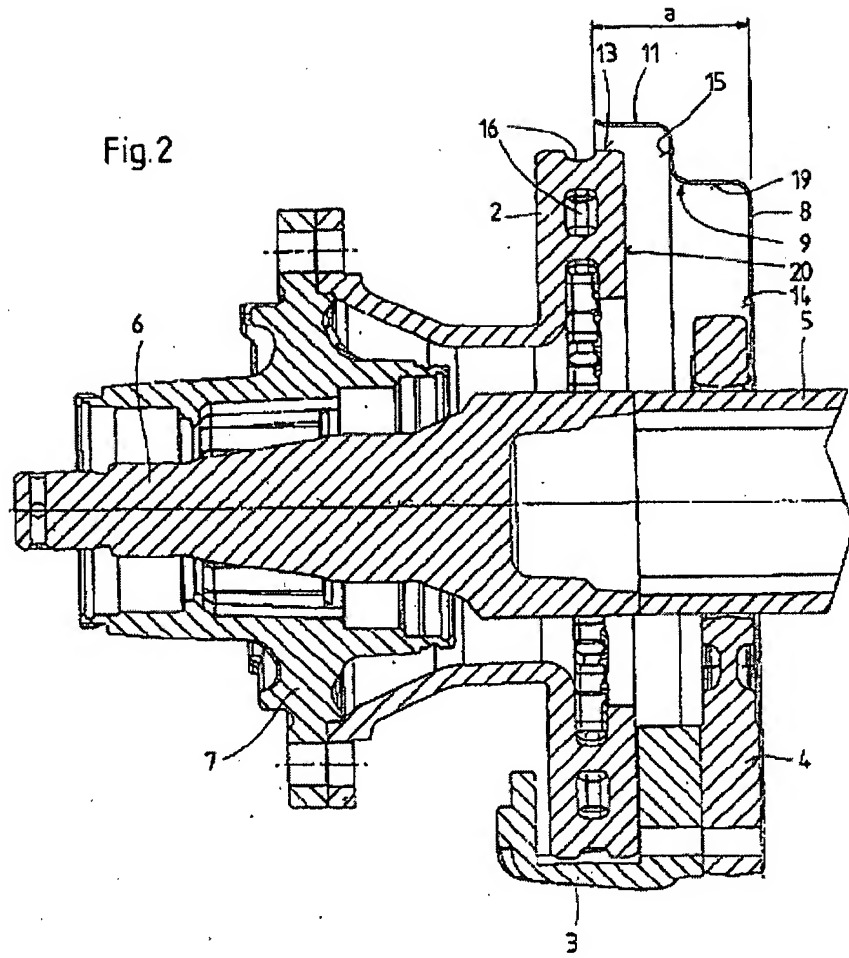


Fig. 3

